

INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP2004/052913

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G02B6/12 C03C3/04

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 G02B C03C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ, WPI Data, INSPEC, COMPENDEX

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|------------|---|--|
| X | WO 99/44937 A (BLOECHL PETER ; GERMANN ROLAND (CH); MASSAREK ILANA (CH); SALEMINK HUU) 10 September 1999 (1999-09-10) cited in the application abstract | 1-17, 20-28, 47 |
| Y | | 29, 30, 32-35, 37-46, 48-50, 52-56 |
| A | page 8, line 15 - line 25 page 14, line 23 - page 15, line 16 page 15, line 24 - page 16, line 3 page 17, line 26 - line 28 ----- -/-- | 18, 19, 31 |

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the International filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the International filing date but later than the priority date claimed

T later document published after the International filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

G document member of the same patent family

Date of the actual completion of the International search

19 January 2005

Date of mailing of the International search report

28/02/2005

Name and mailing address of the ISA

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| C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT | | |
|--|---|---|
| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
| Y | US 2002/154878 A1 (SIMPSON LYNN B ET AL) 24 October 2002 (2002-10-24) | 29,30, 32,33, 37,38, 42-46, 48-50, 52-56 36,47,51 |
| A | abstract paragraphs '0010!, '0011!, '0040!, '0043! - '0047!, '0055!, '0056!, '0059! - '0061! table 2 | |
| Y | PATENT ABSTRACTS OF JAPAN vol. 1997, no. 07, 31 July 1997 (1997-07-31) -& JP 09 080247 A (HITACHI CABLE LTD), 28 March 1997 (1997-03-28) abstract paragraphs '0010! - '0013!, '0016! - '0021!, '0027!; figure 1 | 34,35, 39-41 |
| A | US 6 408 125 B1 (BELLMAN ROBERT ALAN ET AL) 18 June 2002 (2002-06-18) abstract column 2, line 23 - column 3, line 3 column 3, line 37 - column 4, line 7 column 5, line 48 - column 6, line 5 | 1,37,53 |
| A | PATENT ABSTRACTS OF JAPAN vol. 1999, no. 09, 30 July 1999 (1999-07-30) -& JP 11 109158 A (HITACHI CABLE LTD), 23 April 1999 (1999-04-23) abstract paragraph '0020! | 1,37,53 |
| A | CHELNOKOV A V ET AL: "Deep high-dose erbium implantation of low-loss silicon oxynitride waveguides" ELECTRONICS LETTERS, IEE STEVENAGE, GB, vol. 30, no. 22, 27 October 1994 (1994-10-27), pages 1850-1852, XP006001284 ISSN: 0013-5194 the whole document | 27,28 |
| A | GERMANN R ET AL: "SILICON OXYNITRIDE LAYERS FOR OPTICAL WAVEGUIDE APPLICATIONS" JOURNAL OF THE ELECTROCHEMICAL SOCIETY, ELECTROCHEMICAL SOCIETY. MANCHESTER, NEW HAMPSHIRE, US, vol. 147, no. 6, June 2000 (2000-06), pages 2237-2241, XP009016715 ISSN: 0013-4651 cited in the application the whole document | 47,51 |

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Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☒ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-30,32-46,48-50,52-56

Silicon oxynitride waveguide comprising phosphorous and boron or germanium, or a combination of all three elements; or comprising germanium plus an element selected from the group B, Al, P, S, As, Sb.

2. claim: 31

Silicon oxynitride waveguide comprising a dopant selected from the group B, Al, P, S, As, Sb and additionally a dopant for control of thermal expansion selected from the group Al, F, Ti.

3. claims: 47,51

Method of manufacturing a silicon oxynitride waveguide by PECVD in which the silane flow is restricted to be in the range 0-30 sccm.

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International Application No
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| Patent document cited in search report | | Publication date | Patent family member(s) | | Publication date |
|---|----|---------------------|----------------------------------|--|--|
| WO 9944937 | A | 10-09-1999 | EP WO | 0983208 A1 9944937 A1 | 08-03-2000 10-09-1999 |
| US 2002154878 | A1 | 24-10-2002 | GB WO | 2388110 A 02064523 A1 | 05-11-2003 22-08-2002 |
| JP 09080247 | A | 28-03-1997 | JP | 3451809 B2 | 29-09-2003 |
| US 6408125 | B1 | 18-06-2002 | AU CA EP JP WO US | 1432201 A 2391202 A1 1232125 A1 2003513875 T 0134530 A1 2002106174 A1 | 06-06-2001 17-05-2001 21-08-2002 15-04-2003 17-05-2001 08-08-2002 |
| JP 11109158 | A | 23-04-1999 | NONE | | |